

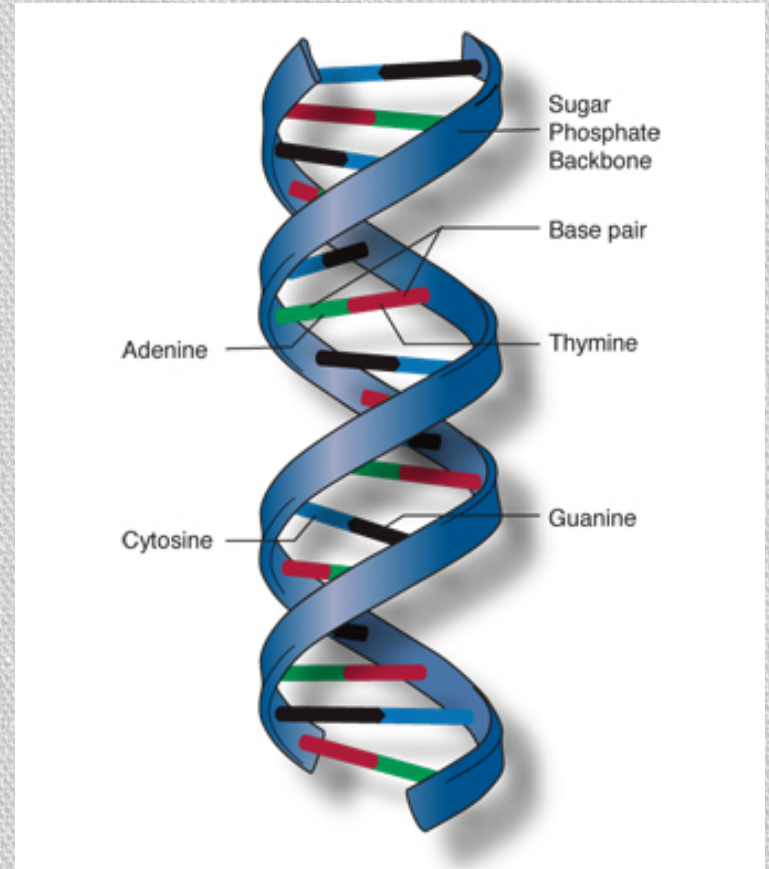


NICE GENES

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What is Genetics?

- Study of heredity and the variation of inherited characteristics
- **DNA**: Deoxyribonucleic acid
 - Made up of sugar, phosphate group, nitrogen bases (adenine, thymine, cytosine, guanine)
 - Double-helix shape
- Gene: section of DNA. Carries information that determine your traits



Dominant vs. Recessive

- Every trait comes with at least two different Alleles
- Allele: a form of a certain gene for a certain trait
 - Represented by letters – Uppercase (A) = Dominant, lowercase (a) = recessive
- Each trait has a pair of a random combination of alleles:

- AA – homozygous dominant

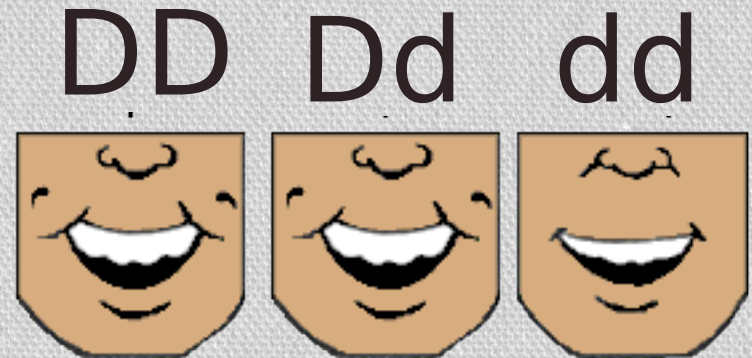
- Aa – heterozygous

- aa – homozygous recessive

} Person will show dominant trait

— Person will show

recessive trait



Genotype vs. Phenotype

Genotype:

- Genetic makeup of an organism
- WW, Ww, ww (having a widow's peak)

Phenotype:

- Physical characteristic that is actually expressed
- Having widow's peak / not having widow's peak

DD



Dd



dd



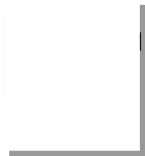



Punnett Squares

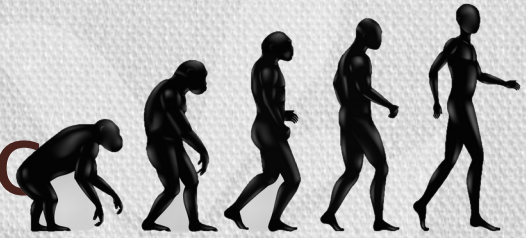
- Punnett squares tell us the probability of a person having a particular trait based on his or her parents

Parent 1 (Rr) X Parent 2 (rr)

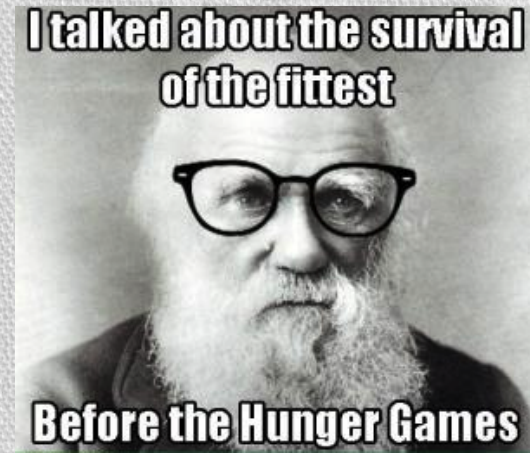
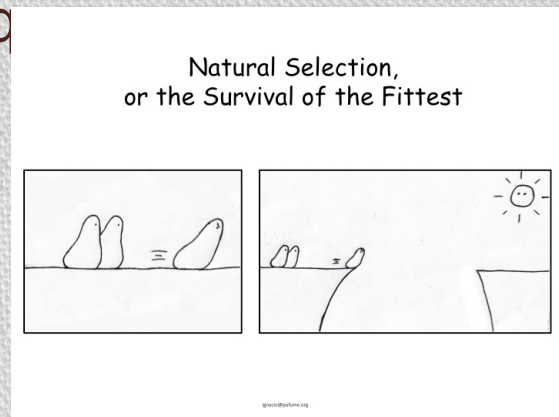
R = can roll tongue (dominant)
r = cannot roll tongue (recessive)

	R	r
r		
r		

Evolution & Genetic



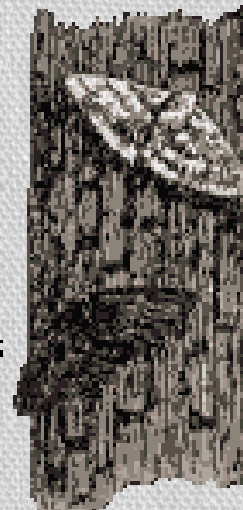
- Do you think all living things today looked exactly the same as they did millions and millions of years ago?
- Things change over time to fit the needs of the environment around them. This is called **adaption**
- Charles Darwin's Theory of Natural Selection
 - Survival of the fittest
 - Organisms with best-suited traits pass on those genes to offspring while poorly suited organisms eventually die off
- New genes and traits come from mutations in the DNA seq



Peppered Moth



light moths



dark moths

light tree

dark tree

Activity!

- You will create your own “thing” with different traits and alleles
- Complete your Punnett Square worksheet
- For each Punnett Square, roll a dice and get a number – this will determine what trait your “thing” will show
- Look at the key for the corresponding trait
- Do your best to draw your “thing” with all the traits that you rolled!



Careers

- Anthropologist – search for ancient existence and track evolution. Deal with fossils
- Geneticist – explore human genes and discover new information about the functions of each one. Can explore various things such as specific diseases and disorders
- Forensic scientist/pathologist – deal with figuring out information of dead people to determine cause of death.
- Molecular Biologist – research how or why specific factors affect an individual's DNA